REMARKS

Claims 1-28 are in the application, of which Claims 1, 8, 15, and 27 are the independent claims. Claims 1, 8, 15 and 27 are amended herein. Claim 29 has been cancelled. Accordingly, reconsideration and further examination of Claims 1-28 is respectfully requested.

No new matter is believed to have been introduced to the application by this amendment. The changes to the claims are believed to be supported by the original disclosure, including, for example, at original paragraphs [0038], [0040], [0042], [0044], [0046] and [0054].

Applicants thank the Examiner and the Examiner's Supervisor for the thoughtful courtesies extended during the telephonic interview held on July 15, 2009. During the interview, Applicants' representatives discussed amendments to independent Claims 1, 8, 15 and 27. No conclusion was reached but the Examiner proposed that Applicants submit further claim amendments, along the lines discussed during the interview. Applicants also thank the Examiner for the voicemail to Applicants' representative on August 10, 2009 suggesting that it may be possible to overcome art of record by amending claims to recite a "selecting a virtual time from a past time, a future time, a slower than real time, a static time and a faster than real time" feature. Applicants have amended Claims 1, 8, 15 and 27 accordingly and submitted for further examination with this paper.

Claim Objections

Claim 29 was objected to under 37 CFR 1.75(c), as allegedly being of improper dependent form for failing to further limit the subject matter of a previous claim.

Applicants have cancelled Claim 29 with this paper, rendering the objection moot.

Claim Rejections – 35 USC § 112

Claims 11 and 17 were rejected under 35 U.S.C. 112, second paragraph, as allegedly being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicants regard as the invention. In particular, the Examiner alleges that phrases "beam strength of land based laser devices," with respect to Claim 11 and "missile threat cloud" with respect to Claim 17 are vague and indefinite.

Regarding the term "beam strength of land based laser devices" Applicants respectfully submit that at the time the invention was made, the term "beam strength of land based laser devices" would have been understood by one skilled in the art as a measure of energy in the laser emission of land based laser devices.

Regarding the term "missile threat cloud," Applicants respectfully submit that at the time the invention was made, the term "missile threat cloud" would have been understood by one skilled in the art to mean a defensive countermeasure designed to prevent sensor-based weapons from acquiring and/or destroying a target (e.g., a missile warhead).

In light of the well-understood meanings of the terms discussed above, Applicants respectfully request reconsideration and withdrawal of the 35 U.S.C. 112 rejection of Claims 11 and 17.

Claim Rejections – 35 USC § 103

Claims 1-5, 7-10, 12, 14-16, 18-25 and 27-29 were rejected under 35 U.S.C. 103(a) as being unpatentable over Slambrook ("Three Dimensional Visualization to Support Command and Control") in view of Leibe ("The Perceptive Workbench: Toward Spontaneous and Natural

Interaction in Semi-Immersive Virtual Environments). Claims 6, 13 and 26 were rejected under 35 U.S.C. 103(a) as being unpatentable over Slambrook in view of Leibe and further in view of Kato ("Virtual Object Manipulation on a Table-Top AR Environment," 2000). Claim 11 was rejected under 35 U.S.C. 103(a) as being unpatentable over Slambrook in view of Leibe and further in view of Nikulin ("Modeling of an Acousto-Optic Laser Beam Steering System Intended for Satellite Communication"). Claim 17 was rejected under 35 U.S.C. 103(a) as being unpatentable over Slambrook in view of Leibe and further in view of Barnhart ("Development and Application of an Object-Oriented Graphical Environment for the Simulation of Space-Based Sensing Systems").

Claim 1 discloses a visualization system for augmented reality, the visualization system for developing a three-dimensional representation of a space system, the visualization system comprising a tangible medium comprising a positioning portion configured to determine a position of a viewer with respect to a real world and a position of the viewer with respect to a virtual world, the positioning portion configured to allow the viewer to interact with the virtual world, a modeling portion configured to specify the virtual world in response to a space system model of the virtual world, the space system model including models for the earth and satellites, the space system model based on historical and projected trajectories of satellites, a model specification portion configured to specify a representation of satellite model status data of the satellites in response to the position of the viewer with respect to the virtual world and in response to satellite model status data of the satellites, an output portion configured to provide a three-dimensional representation of a space system, the three-dimensional representation of the space system including an image of the virtual world super-imposed on an image of the real world as being seen by the viewer, the image of the virtual world including the representation of the satellite model status data of the satellites to the viewer in response to the position of the viewer with respect to the

virtual world, the representation of the satellite model status data of the satellites including a three-dimensional representation of satellite orbits, the image of the virtual world including a three-dimensional representation of the models for the earth and the satellites, a simulation portion configured to select a virtual world time from a past time, a future time, a slower than real time, a static time and a faster than real time, run a simulation of the virtual world in the selected virtual world time, extract a position of an object in the space system model based on the virtual world time and update the image of the virtual world based on the extracted position, and an input portion configured to allow the viewer to select one of the satellites to view satellite model status data of the selected one of the satellites and configured to allow the viewer to move the selected one of the satellites to a different position, wherein the representation of the satellite model status data of the satellites further comprises a representation selected from the group: satellite sensor orientation, satellite sensor position, and satellite system design data.

Claim 8 discloses a method for visualization of augmented reality to develop a three-dimensional representation of a space system, the method comprising determining a position of a viewer with respect to a real world and a position of the viewer with respect to a virtual world, determining a space system model of the virtual world, the space system model including models for the earth and satellites, the space system model based on historical and projected trajectories of satellites, determining a representation of satellite model status data of the satellites in response to the position of the viewer with respect to the virtual world and in response to satellite model status data of the satellites, displaying to the viewer a three-dimensional representation of a space system, the three-dimensional representation of the space system including a representation of the virtual world super-imposed on a representation of the real world as being seen by the viewer, the representation of the virtual world including the representation of the satellite model status data of

the satellites in response to the position of the viewer with respect to the virtual world, the representation of the satellite model status data of the satellites including a three-dimensional representation of satellite orbits, the image of the virtual world including a three-dimensional representation of the models for the earth and the satellites, selecting one of the satellites, by the viewer, to view satellite model status data of the selected one of the satellites, moving the selected one of the satellites, by the viewer, to a different position, selecting a virtual world time from a past time, a future time, a slower than real time, a static time and a faster than real time, running a simulation of the virtual world in the selected virtual world time, and updating the image of the virtual world based on the virtual world time by extracting a position of an object in the space system model, wherein the representation of the satellite model status data of the satellites further comprises a representation selected from the group: satellite sensor orientation, satellite sensor position, and satellite system design data.

Claim 15 discloses a method for visualization of augmented reality, the method for developing a three-dimensional representation of a space system, the method comprising determining a space system model of a virtual world, the space system model including models for the earth and satellites, the space system model based on historical and projected trajectories of satellites, determining a representation of satellite model status data of the satellites in response to satellite model status data of the satellites, and in response to a position of a viewer with respect to the virtual world, determining a representation of the virtual world in response to the space system model of the virtual world and in response to a position of the viewer with respect to the virtual world, displaying to the viewer a three-dimensional representation of a space system, the three-dimensional representation of the space system including a representation of a real world as being seen by the viewer overlaid with the representation of the virtual world, the representation of

the virtual world including the representation of the satellite model status data of the satellites, the representation of the satellite model status data of the satellites including a three-dimensional representation of satellite orbits, the representation of the virtual world including a three-dimensional representation of the models for the earth and the satellites, selecting one of the satellites, by the viewer, to view satellite model status data of the selected one of the satellites, moving the selected one of the satellites, by the viewer, to a different position, selecting a virtual world time from a past time, a future time, a slower than real time, a static time and a faster than real time, running a simulation of the virtual world in the selected virtual world time, and updating the image of the virtual world based on the virtual world time by extracting a position of an object in the space system model, wherein the viewer is allowed to interact with the virtual world.

Claim 27 discloses a visualization system for augmented reality, the visualization system for developing a three-dimensional representation of a space system, the visualization system comprising a processor for executing instructions, the instructions comprising determining a position of a viewer with respect a real world and a position of the viewer with respect to a virtual world specifying the virtual world in response to a space system model of the virtual world, the space system model including models for the earth and satellites, the space system model based on historical and projected trajectories of satellites, specifying a representation of satellite model status data of the satellites in response to the position of the viewer with respect to the virtual world and in response to satellite model status data of the satellites, providing a three-dimensional representation of a space system, the three-dimensional representation of the space system including an image of the virtual world super-imposed on an image of the real world as being seen by the viewer, the image of the virtual world including the representation of the satellite model status data of the satellites to the viewer in response to the position of the viewer with respect to the

virtual world, the representation of the satellite model status data of the satellites including a three-dimensional representation of satellite orbits, the image of the virtual world including a three-dimensional representation of the models for the earth and the satellites, selecting a virtual world time from a past time, a future time, a slower than real time, a static time and a faster than real time, running a simulation of the virtual world in the selected virtual world time, updating the image of the virtual world based on the virtual world time by extracting a position of an object in the space system model, and allowing the viewer to select one of the satellites to view satellite model status data of the selected one of the satellites and allowing the viewer to move the selected one of the satellites to a different position.

The applied references are not understood to disclose or suggest the features of Claims 1, 8, 15 and 27, particularly with respect to at least the following features: "a modeling portion configured to specify the virtual world in response to a space system model of the virtual world, the space system model including models for the earth and satellites, the space system model based on historical and projected trajectories of satellites," and "a simulation portion configured to select a virtual world time from a past time, a future time, a slower than real time, a static time and a faster than real time, run a simulation of the virtual world in the selected virtual world time, extract a position of an object in the space system model based on the virtual world time and update the image of the virtual world based on the extracted position."

Turning to the applied references, Slambrook discloses three-dimensional visualization to support command and control (title). Specifically for satellite application, Slambrook teaches that "[t]ime may be controlled in the simulation such that a particular date may be chosen for observation as well as increased or decreased to aid in analysis," (page 12, paragraph 3). Therefore, although Slambrook can select a particular date, Slambrook is not understood to teach "a

simulation portion configured to *select a virtual world time from a past time, a future time, a slower than real time, a static time and a faster than real time*, run a simulation of the virtual world in the selected virtual world time, extract a position of an object in the space system model based on the virtual world time and update the image of the virtual world based on the extracted position," (emphasis added) as recited in Claim 1 of the present invention. Furthermore, Slambrook is understood to teach creating a virtual reality satellite environment by simulating various satellites, their orbits and dynamics (page 12, paragraph 3). Slambrook is therefore not seen to disclose or suggest the "a modeling portion configured to specify the virtual world in response to a space system model of the virtual world, the space system model including models for the earth and satellites, *the space system model based on historical and projected trajectories of satellites*," feature recited in Claim 1 of the present invention.

Leibe discloses a semi-immersive virtual environment (title). Even if Leibe were combined with Slambrook in the sense of "superimposing a view of the virtual world on an image of the real world as seen by the viewer," as suggested by the Examiner, Leibe is seen to be silent about "select[ing] a virtual world time from a past time, a future time, a slower than real time, a static time and a faster than real time" as recited in Claim 1 of the present invention.

Applicants respectfully submit that, at least based on the arguments provided above, Claim 1 and Claims 2-7 depending from Claim 1 are in condition for allowance. Reconsideration and withdrawal of 35 U.S.C. 103 rejection of Claims 1-7 is respectfully requested.

Independent Claims 8, 15 and 27 include features similar to those discussed with respect to Claim 1 above. Applicants respectfully submit that, at least for the reasons presented with respect to Claim 1 above, independent Claims 8, 15, and 27, and Claims 9-14, 16-26 and 28 that depend

from their respective independent claims are also in condition for allowance. Reconsideration and withdrawal of 35 U.S.C. 103 rejection of Claims 8-28 is respectfully requested.

In view of the foregoing amendments and remarks, the entire application is believed to be in condition for allowance and such action is respectfully requested at the Examiner's earliest convenience. Applicants' undersigned attorney may be contacted at the address and telephone number set forth below.

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 501216 and please credit any excess fees to such deposit account.

Respectfully submitted,

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